
Regarding the Correlation Between Interstellar Pick-Up Ions and Solar
Wind Protons

D. Winterhalter, G. Gloeckler, E. J. Smith, P. Isenberg, B. E.
Goldstein, and A. Balogh
Jet Propulsion Laboratory, California Institute of Technology Pasadena,
CA 91109-8099 United States
University of Maryland College Park, MD 20742-2425 United States
University of New Hampshire Durham, NH 03824-3525 United States
Blackett Laboratory, Imperial College London, United Kingdom

Interstellar hydrogen is primarily ionized by charge exchange with solar
wind protons. This directly implies that the pick-up hydrogen density
should be linearly correlated with the solar wind proton density.
However, it has been reported that this correlation is very poor,
probably because of the limited data set used in the previous studies.

In this study, we use Ulysses data from 1990 to 1997. We compare daily
averages of the pick-up hydrogen obtained by the SWICS instrument with
daily averages of solar wind parameters, primarily the solar wind proton
density, obtained by SWOOPS. In addition, measurements by the
magnetometer were used to investigate any contribution by the
heliospheric magnetospheric field direction and fluctuation to the solar
wind/pickup hydrogen interaction.